1949
Annu Rev Microbiol.

mating as closely as possible those of the variation experiment. This work is quoted at such length because it is a remarkably good example of a difference in the behavior of a population at different initial concentrations. Although it is not established that these salts influence variation per se, it is no less interesting that such materials can so profoundly influence the behavior of a population.

A report (68) whose evaluation is less certain now concerns the influence of acetate on mucoid to smooth variation in a group C hemolytic streptococcus. This organism is unstable in medium lacking acetate, and cultures rapidly become smooth after three to six transfers, although the mucoid form is perpetuated in the presence of acetate. The smooth variants are stable, not reverting to mucoid during 14 transfers in acetate medium, so that we have a heritable variation, not an environmental effect. In order to dispose of selection "two single S phase cells were mixed in acetate-containing broth containing 5,000,000 M phase cells. After eighteen hours incubation at 37°C. equal numbers of M and S forms were present." The authors therefore conclude that whether acetate is present or not, the S form has such a powerful selective advantage that, if formed, it should predominate. This is certainly the kind of evidence which should be adduced in support of their hypothesis, but it is regrettable that a more complete study of the population dynamics has not yet been made. It may be pointed out that the S phase consists of long chains of cocci, so that many more than two cells were undoubtedly introduced in this limited reconstruction experiment. It is interesting to notice that S has such a selective advantage in view of the remark that "the growth rates of (S and M) in both . . . media were identical. . . ." Such interactions not explainable in terms of the growth rates of the isolated cultures are quite common. However, these combinations can be expected to be the most unstable, especially with respect to the proportion of cells of the variant which is initially needed for it to predominate. If further work confirms this response as induced directly by the absence of acetate, it would probably be best explained as depletion of a cytoplasmic factor, like the attenuation of kappa in *Paramecium* (79). Kinetic studies on the rate of transformation of individual cells and their progeny in acetate free medium would then give considerable insight into the mechanism. However, it still seems an open question to this reviewer whether these results are best accounted for by direct induction or by spontaneous mutation and selection.

Personal memo from
JOSHUA LEDERBERG

Vince Fischetti

JUN 15 1988

Ancient history

Is acetate effect on strep a plasmid loss? (McIlroy 1948)

In view of Pasteur's 1881 heat attenuation of anthrax now being interpreted as plasmid loss, perhaps one should not be too skeptical.

Have you heard of anything on this since 1948?

JL

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